DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
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29 May 02

From: Commander, Naval Facilities Engineering Command, Engineering Innovation and Criteria Office (Code EICO)

To: Distribution

Subj: ITG FY02-02, INTERIM TECHNICAL GUIDANCE "ENERGY CONSERVATION CRITERIA Using ASHRAE STANDARD 90.1 of 1999"

Encl: (1) ENERGY CONSERVATION CRITERIA Using ASHRAE STANDARD 90.1 of 1999

1. Purpose. To provide interim technical guidance for using ASHRAE/IESNA Standard 90.1 of 1999, with ASHRAE/IESNA approved addendums, for design of new facilities, and design of modifications to existing facilities. This guidance may be retained for record purposes until it is incorporated into Unified Facilities Criteria (UFC) documents.

2. Background. The American Society of Heating, Refrigerating, and Air Conditioning Engineers issued Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings, dated 1999. Enclosure (1) provides guidance for the use of ASHRAE STD 90.1 of 1999. The Department of Energy removed 10 CFR 435 and issued 10 CFR 434 as of 8 Oct. 2001. DON made a recommendation to the ESEP to adopt ASHRAE/IESNA Standard 90.1 of 1999 in lieu of 10 CFR 434. The ESEP approved using Standard 90.1 of 1999 on 11 October 2001.

3. Action.

a. Design. All projects starting design after 8 October 2001, the effective date of 10 CFR 434, must meet or better the energy conservation requirements of ASHRAE/IESNA Standard 90.1 of 1999, and Encl. 1.

b. Criteria. The NAVFAC Criteria Office will coordinate the drafting of a Unified Facilities Criteria (UFC) document to incorporate the use of ASHRAE/IESNA Standard 90.1 of 1999 in lieu of the DOD Design Energy Targets.

4. Points of Contact. For additional information concerning ASHRAE/IESNA Standard 90.1, the following points of contact are provided: NAVFAC Criteria Office - Mr. Thomas J. Harris, P.E. at DSN 262-4206, commercial 757-322-4206, FAX at 4416, or via Internet at harristj@efdlant.navfac.navy.mil.

T. J. HARRIS
By direction

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ENERGY CONSERVATION CRITERIA
Using
ASHRAE STANDARD 90.1 of 1999

1. **Purpose and Scope.** This Interim Technical Guidance (ITG) establishes the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1 of 1999, with approved addendums, as the standard and minimum criteria to ensure that energy-conserving designs are developed for new construction and major renovation projects for facilities on Department of the Navy (DON) installations. Incorporate all applicable life-cycle-cost-effective energy-conservation features, per Executive Order (E.O.) 13123, Sections 707 and 708, into project designs, whether using appropriated or other funds, unless Life-Cycle-Cost-Analysis (LCCA) calculations indicate the particular energy conservation feature is not cost effective. Retain all LCCA calculations in the project files.

2. **Applicability and Cancellation.** The Department of Defense has adopted the ASHRAE Standard 90.1 of 1999, in lieu of 10 CFR 434, per Section 306 of the Energy Conservation Policy Act, as amended; and per the National Technology Transfer and Advancement Act of 1995, Section 12(d), Pub. L. 104-113. The DESIGN ENERGY TARGET REDUCTIONS, INTERIM TECHNICAL GUIDANCE dated 5 June 1995 is hereby cancelled and replaced by this Interim Technical Guidance until such time as a Unified Facilities Criteria (UFC) document is published for the Tri-Services.

3. **General Guidance.** Accomplish the facility functional requirements using the least complex design that meets the requirements of ASHRAE Standard 90.1 of 1999. Place emphasis on using passive features (e.g. insulation, orientation, etc.) vice active systems (e.g. heat recovery, co-generation, etc.).

4. **Compliance.** This ITG applies to all DON buildings, including Bachelor Quarters and Navy Lodges, except Low-Rise Residential Buildings, in accordance with ASHRAE STD 90.1 of 1999, Section 2. For the building types listed in ASHRAE STD 90.1 of 1999, Section 4.1, design per the Sections 5, 6, 7, 8, 9, & 10, **OR** per Section 11. Provide the Compliance Documents required by Section 4.3, submitting them for review and approval by the Contracting Officer. Building designs intended to comply with Section 11 will also be fully documented per Section 11.1.5. Simulation programs will comply with Section 11.2. In addition, provide completely filled-in Compliance Forms for Building Envelope, HVAC, Service Water Heating, and Lighting, or Compliance Forms for Energy Cost Budget Method, as provided in the "90.1 User's Manual".

4.1 **Exceptions.** ASHRAE STD 90.1 does not apply to family housing (single family, duplex, and three story or less apartment buildings), or to buildings primarily housing industrial, manufacturing, and commercial equipment and processes.

For Family Housing, see the requirements in NAVFACINST 11101.85H, which in general requires compliance with Energy Star® standards.

Spaces and buildings housing industrial, manufacturing, or commercial processes that impose thermal loads in excess of 5% of the load that would otherwise be required for heating, cooling, ventilating or service hot water requirements, are exempt from the Building Envelope, Heating/Ventilating/Air-Conditioning, Service Water Heating, and some Lighting requirements, in a manner similar to that allowed by 10 CFR 434.101.2.

5. **Interpretation of Terms.** Interpret the terms used in ASHRAE STD 90.1 of 1999 as follow:

"Authority having jurisdiction (AHJ)" to mean the Contracting Officer or his representative; the Government Design Engineer during design, and the ROICC during construction.

"Building Official" to mean a representative of the Contracting Officer.

"Owner" to mean the government.

"Permit Holder" to mean the contractor.

6. **Life Cycle Cost Analysis.** For designs per Section 11 of ASHRAE STD 90.1 of 1999, computer calculations will be performed using a computer program determined to be equivalent to the Life Cycle Cost in Design (LCCID) program, PC-Econpack, or Building Life Cycle Cost (BLCC). LCCA calculations will include the Energy Cost Budget figures per Section 11, plus the investment, maintenance, and other costs listed in E. O. 13123, Sections 707 & 708. Document in the design analysis and retain in the project file, the essential elements of the design selection process, including as a minimum, the basis for which the list of feasible alternatives was developed and the basis upon which the various design decisions were reached.

7. **Energy Costs to be Included.** For a single building or facility , include all energy costs in the LCCA. For buildings or facilities served by central energy plants, include only the net energy costs attributable to the building or facility being studied. Credit the building for any energy returned to the central plant, such as steam condensate or return hot or chilled water. Distribution losses and plant conversion losses will not be attributed to the building or facility. Credit the building for any renewable energy produced on site, such as solar, wind, or others per E. O. 13123, Sections 710 & 711.

8. **Meters.** Recommend providing a meter for each utility serving the building (e.g. steam, high or low temperature hot water, electricity, natural gas, fuel oil, etc.), calibrated in the units billed by the utility supplier (i.e. kW-hr, cubic feet, gallons, pounds, etc.) to allow determination of energy consumption and verification of utility bills. As a minimum, make provisions for check metering or meter installation to allow energy analysis surveys of the facility; show the locations on the utility service drawings and one-line diagrams.

9. **Weather Data.** The STD 90.1 Building Envelope Requirements Table selection is based upon Heating Degree Days based upon 65 degrees F. (HDD65F) and Cooling Degree Days based upon 50 degrees F. (CDD50F). Use the Engineering Weather Data (EWD) available at www.afccc.af.mil as the first choice; second choice is ASHRAE weather data, and lastly locally

available weather data. Until the EWD is modified to include CDD50F data, use the CDD50F data in Tables D-1, D-2, and D-3 in ASHRAE STD 90.1.

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